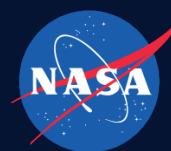


Advanced Green Micropropulsion System, Phase II Project

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ABSTRACT

Systima in collaboration with University of Washington is developing a high performance injection system for advanced green monopropellant AF-M315E micropropulsion systems (0.1 – 1.0 N) for small- and micro-satellites and cubesats (100 kg- 500 kg and <100 kg). The monopropellant has low-toxicity making it easy to store, integrate into modular designs and launch without added costs associated with handling toxic propellants such as hydrazine. The injector is a critical component that is designed to enhance combustion and optimize microthruster performance. In the Phase I program, Systima and UW completed proof-of-concept tests that demonstrated the injector technical concept and system advantages. In the Phase II program we will develop a prototype injector design, conduct injector performance testing and workhorse microthruster hot-fire tests with AF-M315E. This effort will result in a monopropellant injection system for modular microthruster system designs that meets the needs of current and future small- and micro-satellites for NASA missions, commercial and military customers.

ANTICIPATED BENEFITS

To NASA funded missions:

Green monopropellant micropropulsion systems with Systima's high performance injector offer safer handling, reduced system complexity, decreased launch processing times and increased performance compared to conventional hydrazine micropropulsion systems, and are well suited for a wide range of NASA spacecraft missions. Spacecraft micropropulsion systems with Systima's high performance injector can be used for; orbit maintenance, fine attitude control, troubleshooting and maintenance, and potential needs for quick response at relatively high Isp.

To the commercial space industry:

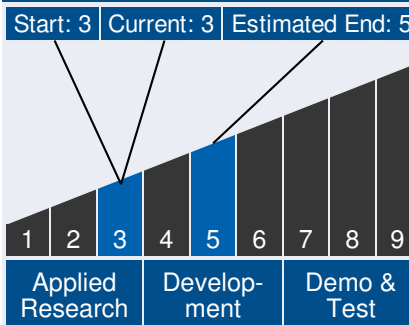
Green monopropellants offer significant advantages in



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Technology Maturity



Management Team

Program Executives:

- Joseph Grant
- Laguduva Kubendran

Program Manager:

- Carlos Torrez

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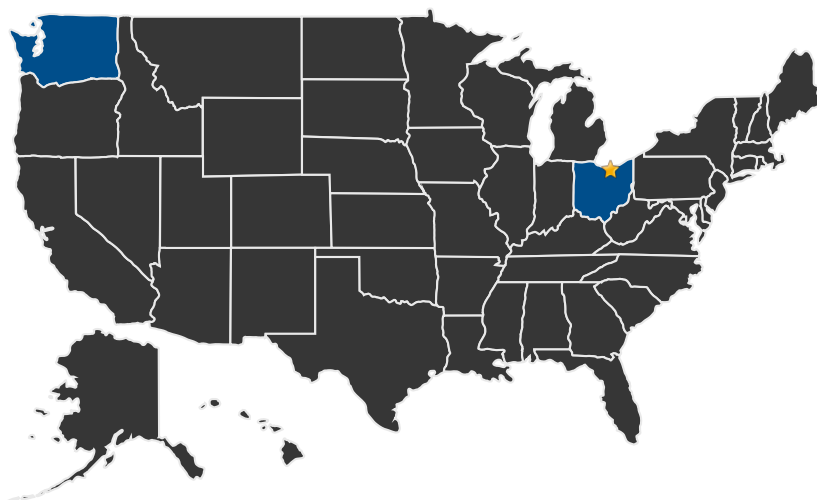
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performance and reduced handling infrastructure for commercial and military small and micro satellites and payloads, and allow for modular designs for rapid response capabilities. Systima's injector technology is well suited for micropropulsion systems for orbital insertion or transfer, stationkeeping and drag compensation and attitude control.

U.S. WORK LOCATIONS AND KEY PARTNERS



■ U.S. States
With Work

★ **Lead Center:**
Glenn Research Center

Other Organizations Performing Work:

- Systima Technologies, Inc. (Bothell, WA)
- University of Washington, Dept. Aeronautics & (Seattle, WA)

Management Team (cont.)

Project Manager:

- William Marshall

Principal Investigator:

- Stephanie Sawhill

Technology Areas

Primary Technology Area:

In-Space Propulsion

Technologies (TA 2)

- └ Chemical Propulsion (TA 2.1)
 - └ Liquid Storable (TA 2.1.1)
 - └ Monopropellants (TA 2.1.1.1)

Secondary Technology Area:

In-Space Propulsion

Technologies (TA 2)

- └ Chemical Propulsion (TA 2.1)
 - └ Micropropulsion (TA 2.1.7)



IMAGE GALLERY



*Advanced Green Micropropulsion
System*

DETAILS FOR TECHNOLOGY 1

Technology Title

Advanced Green Micropropulsion System